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AUTHOR Williams, Walter E.
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ABSTRACT

At the University of South Florida the College of Natural Sciences administers the premedical sciences advising program. The program is designed to assist students seeking admission to a professional school in the health sciences. Advisors in the program have the dual responsibility of counselor and evaluator. The evaluation process estimates the potential of the applicant as a professional in the field. To assist the advisors in evaluation, an investigation was conducted to determine the cognitive and noncognitve variables that had the greatest correlation and predictive value for successful admission to schools of medicine and dentistry. A multiple regression analysis was performed on data collected from the files of applicants from the College, separately for premedical and predental students. The results from the College, separately for premedical and predental students. The results indicate that the selection process remains highly subjective for both groups. Grades and test scores continue to be key factors, but other variables such as ratings by former instructors are also important. The analysis identified the top 11 variables that in combination have the greatest predictive value for medical school admission, and for dental schools the top eight variables were identified. It is recommended that the results be disseminated to premedical science students and advisors. (Author/MSE)

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ED163844

A SURVEY OF UNIVERSITY OF SOUTH FLORIDA APPLICANTS TO PROFESSIONAL SCHOOLS IN THE HEALTH SCIENCES

APPLIED EDUCTIONAL RESEARCH AND EVALUATION MODULE

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by

Walter E. Williams M.A.

University of South Florida

DR. VALDA ROBINSON

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Abstract

At the University of South Florida, the College of Natural Sciences administers the pre-medical sciences advising program. This program is designed to assist students seeking admission to a professional school in the health sciences. Advisors in the program have the dual responsibility of counselor and evaluator. The evaluation process estimates the potential of the applicant as a professional in the field.

The revolution in social values which began in the sixties has resulted in a change in the selection criteria for admission to professional schools, with added emphasis on subjective criteria. The nature of these criteria are not clearly defined, but they add a new dimension to the responsibility of the advisor.

To assist the advisor in the evaluation process, an investigation was conducted to determine the cognitive and non-cognitive variables which had the greatest correlation and predictive value for successful admission to schools of medicine and dentistry. A multiple regression was performed on data collected from the files of applicants from the College applying to professional schools in medicine and dentistry. The specific research questions asked in the study were:

1. What are the characteristics of the successful applicants (a) to a school of medicine (b) to a school of dentistry?
2. What variables have the highest correlation with success ful admission to a professional school in (a) medicine (b) dentistry?
3. Which combinations of variables have the highest predictive value with success in admission to a professional school in (a) medicine (b) dentistry?

The multiple regression was performed using the regression subprogram of the Statistical Package for the Social Sciences. Regressions were performed on the pre-medical and pre-dental applicants separately on the assumption that selection criteria vary for these professions.

The results of the survey indicated that the selection process remains highly subjective for both groups. Grades and test scores continue to be key factors, but other variables are also important, such as ratings of former instructors. There is considerable overlap in the characteristics of the successful and unsuccessful applicant. The regression analysis identified the top eleven variables which in combination had the highest predictive value with admission to a medical school; for the pre-dental group, the regression identified eight variables.

It was recommended that the results be disseminated to pre-medical sciences students and to advisors in the pre-medical sciences program. For the former, the results can be used as a competition yardstick; for the latter, the results can be used to improve the advising and evaluation process.

TABLE OF CONTENTS

	Page
LIST OF TABLES	4
INTRODUCTION	5
BACKGROUND AND SIGNIFICANCE	7
PROCEDURE	9
RESULTS	15
DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS	26
REFERENCES	29

LIST OF TABLES

Table Page

1. Profile of a Successful Applicant to a School of Medicine or Dentistry.....16
2. Characteristics of Applicants to Medical Schools.....17
3. Characteristics of Applicants to Dental Schools.....18
4. Range of Values for Successful and Unsuccessful Applicants to Medical and Dental Schools.....19

Introduction

At the University of South Florida, the College of Natural Sciences administers the pre-professional advising program. This program is designed for students seeking admission to a professional school in the health sciences. The number of students in the program constitutes about one third of the students in the College, reflecting both the national interest of students in the health sciences and the presence of a college of medicine on campus.

Advisors in the pre-medical sciences advising program have a dual role. One responsibility is to counsel students concerning the minimum requirements for admission to a professional school. These include curriculum choices, volunteer opportunities, entrance examinations, application data, etc. A second role of the advisor is that of evaluator. Admission to professional schools in the health sciences traditionally is by selected admissions, and one factor in the selection process is the recommendation of the pre-professional advisor. This recommendation estimates the potential of the candidate as a member of the profession. While the recommendation of the advisor is not the sole criterion for admission, it is an important factor in the initial screening; and, if the advisor has established a reputation for accuracy in judging potential candidates, it can become a significant factor.

If the recommendation of the pre-professional advisor is an important step in the admissions process, then the advisor must be familiar with those attributes that a candidate should possess to be successful. Traditionally, these have been objective measures such as grade point average, science grades, scores on standardized tests, etc. However, the social revolution of the sixties has prompted professional schools

to re-examine their requirements and to include non-cognitive qualities in their selection criteria. These subjective factors have added a new dimension to the evaluation process of the pre-professional advisor.

To assist the advisor in the evaluation process, the investigator conducted an analysis of the variables used in the evaluation process to determine which variables had the highest predictive correlation with successful admission to a professional school in medicine or dentistry. Files of applicants from the University of South Florida to professional schools in medicine and dentistry were surveyed, and a list of both cognitive and non-cognitive variables was generated. These variables were analyzed using a multiple regression to ascertain which of the variables had the highest predictive quality for successful admission. The specific research questions asked in the study were:

1. What are the characteristics of the successful applicants (a) to a school of medicine (b) to a school of dentistry?
2. What variables have the highest correlation with successful admission to a professional school in (a) medicine (b) dentistry?
3. Which combinations of variables have the highest predic tive value with success in admission to a professional school in (a) medicine (b) dentistry?

The purpose of the survey was twofold. By identifying the variables leading to successful admission to professional schools in medicine and dentistry, the evaluation process of the pre-professional advisors should improve, in that these variables can be examined and reported in the evaluation. Second, students will become better acquainted with the requirements for admission into medicine or dentistry

and can compare their own attributes with those of successful candidates.

Background and Significance

One of the popular areas of student interest in this decade has been in the health sciences, particularly in medicine and dentistry. There are solid economic reasons for this popularity. In 1977, the median salary for physicians was $58,000 per annum (Main, 1977). Understandably, this occupation is predicted to be one of the ten best in the 1980's.

A measure of student interest in the health sciences can be seen in the number of applicants to medical schools. In five years, applications increased 45%, from 29,172 in 1971-72, to 42,303 in 1975-76 (Dube and Gordon, 1976). Other health science areas also have shown impressive gains during this period. But the increase in student interest has not been matched by opportunities in these fields. The number of applicants accepted to medical schools during the period 1971-1975 rose only 25 percent, from 12,335 in 1971-72 to 15,365 in 1975-76 (Dube and Gordon, 1976). This meant the percent of applicants dropped from 42.3 to 36.3 during this interval.

The preceding figures indicate increased competition for the available spaces and is reflected in undergraduate grade point averages and scores on the Medical College Admission Test (MCAT), two of the primary criteria for admission to medical schools. For example, from 1971 to 1972, medical students with premedical grade point averages of 3.60 to 4.0 rose 6.9 percent (Association of American Medical Colleges, 1974). During this same period, scores on the MCAT increased 29 points (Dube and Gordon, 1976).

The 1970's have also been characterized by a continuation of the social consciousness bred in the 1960's. Prodded by minority groups and the federal government, professional schools have re-examined their admissions criteria to determine if too much emphasis has been placed on cognitive predictors at the expense of personal qualities (Angel, 1977). Traditionally, undergraduate grade point averages and scores on tests such as the MCAT or DAT (Dental Admissions Test) were the primary selec-tion criteria for entrance into professional schools. Now, non-cognitive qualities are given added emphasis. A quotation from the Association of Medical Colleges (1974) illustrates the new attitude:

> ...it should be emphasized that a variety of factors go into the decision making process of selecting medical students. Medical schools are becoming more and more responsive to the nation's social issues and the problems in health care delivery. There are also attempts to broaden the socioeconomic opportunities for men and women from minority groups. (Medical School Admission Requirements, 1974, p.3)

A key step in the admission of students to professional schools is the recommendation of their pre-professional advisor. Admissions committees rely heavily on the evaluation of such advisors and many colleges and universities with pre-medical sciences programs have counseling staffs whose sole assignment is to provide this information. The increased emphasis on subjective factors in the admissions criteria for professional schools has added a new dimension to the responsibility of these advisors.

But what are the non-cognitive factors that are important in admission to a professional school in the health sciences? Admissions committees are traditionally vague in describing such requirements. The following description from a school of dentistry is typical of the

language used in describing selection procedures:

> The choice of students is made after due consideration of many factors: the standard of the college attended, academic grades received, recommendations from the college, scores on the Dental Admissions Test, and finally the opinion of the Committee on Admissions regarding the applicant's character, fitness to pursue the study of dentistry and promise for the future as compared witht other applicants. (Admission Requirements of U.S. and Canadian Dental Schools, 1974, p.34) (Emphasis the author's.)

If professional schools are reticent to specify admissions criteria, the information may be available from student records. Records from the pre-medical sciences admission files of the College of Natural Sciences would be the source of a survey of successful and unsuccessful applicants to professional schools in the health sciences. The results of the survey would be statistically analyzed by multiple regression techniques to determine those variables which have the greatest correlation and predictive value for entrance into a professional school in the health sciences. Because of the nature of the research design and the statistical techniques to be utilized, this survey meets the requirements of the Applied Educational Research and Evaluation module.

Procedure

During the academic year 1976-1977, advisors in the pre-medical sciences advising program evaluated a total of 172 applicants to professional schools in the health sciences. Of these applicants, 131 applied to medical schools and 28 to dental schools. Since there remained only 13 applicants to all other professional schools, these were eliminated from the survey.

Because of the relatively small number of applicants to dental

schools, this entire population was selected for the study. Applicants to medical schools consisted of two types: those to allopathic medical schools, and those to osteopathic medical schools. Further investigation revealed that applicants to osteopathic schools must have a recommendation from an osteopathic physician to be admitted to an osteopathic medical school. Because this criterion for admission was not required by other professional schools, these applicants were excluded from the survey.

From the applicants to allopatic medical schools, a random sample of 45 was selected. The sample was drawn by numbering the alphabetical files, then selecting using a table of random numbers.

Files of the sample applicants were examined and data were recorded on punch cards, then errors were corrected in a "frequencies on data" run from the SPSS (Statistical Package for the Social Sciences). Following correction of errors in key punch, the data was split into pre-medical applicants and pre-dental applicants. This split was made on the assumption that admission criteria are different for these two groups. Following separation, a frequencies on data run was made on each group. These runs were programmed to divide the applicants into successful and unsuccessful applicants. The purpose of this separation was to be able to profile the characteristics of the successful applicant versus the unsuccessful applicant.

Data for the pre-medical applicants and the pre-dental applicants were then processed through the multiple regression subprogram of the SPSS. The investigator chose Option 2 of the subprogram which causes a pairwise deletion of missing data. With this option, a missing value for a particular variable causes that case to be eliminated from

calculations involving that variable only. Despite the risks involved with this option, it was chosen because the majority of the variables had only a few cases of missing data.

The independent variable V1 in the study is admission; its operational definition is successful admission to a professional school in medicine or dentistry.

The independent variables in the study were as follows:

V2 Age

V3 Sex

V4 Appearance

V5 Personality

V6 Status of Parents

V7 Number of Brothers and Sisters

V8 Occupational Status of Breadwinner

V9 Occupational Area of Breadwinner

V10 Relative in Profession

V11 Total Transfer Hours

V12 Transfer Grade Point Average

V13 Total U.S.F. Hours

V14 U.S.F. Grade Point Average

V15 U.S.F. Science Grade Point Average

V16 Number of Scholarships

V17 Number of CLEP Hours

V18 Graduated with Honors

V19 Number of Courses Dropped

V20 Average Load per Term

V21 Academic Major

V22 Job in High School

V23 Part Time Job in College

V24 Full Time Job in College

V25 Volunteer Work in Health Area

V26 Number of Instructor Recommendations

V27 Number of Superior Ratings by Instructors

V28 Number of Good Ratings by Instructors

V29 Number of Average Ratings by Instructors

V30 Number of Highly Desirable Overall Instructor Ratings

V31 Number of Desirable Overall Ratings by Instructors

V32 Number of Less than Desirable Ratings by Instructors

V33 Overall Rating of the Evaluator

V34 MCAT Subscore (Verbal)

V35 MCAT Subscore (Quantitative)

V36 MCAT Subscore (General Information)

V37 MCAT Subscore (Science)

V38 Total Score Florida Twelfth Grade Test

V39 DAT Average (Pre-dental Applicants Only)

V40 PMAT Average(Pre-dental Applicants Only)

V41 College Honor Society Membership

V42 College Membership in Social Clubs or Social Organizations

Qualitative variables in the survey were variables 3,4,5,8,9,10,18, 21,22,23,24,25,33,41, and 42, and most were answered by a yes or no response. The remaining variables were quantitative variables, all discrete except for 12, 14, and 15, which were continuous.

The majority of the independent variables were operationally defined in the obvious way; those requiring a more complete definition follow.

Variables 4 and 5 were defined by responses to a Likert scale ranging from below average to above average. Variable 6 determined how many parents were living and their current marital status. Variables 27 through 31 were defined by responses to a questionnaire completed by former instructors of the applicants. The questionnaire rated students in personality characteristics, academic ability and psychomotor ability. Variable 32 was the evaluator's rating, an overall rating on a Likert scale ranging from not recommended to highly recommended.

The investigation was conducted in an effort to answer the following research questions:

1. What are the characteristics of the successful applicants to a professional school in (a) medicine (b) dentistry?
2. Which variables have the highest correlation with successful admission to a professional school in (a) medicine (b) dentistry?
3. Which combination of variables have the highest predictive value with success in admission to a professional school in (a) medicine (b) dentistry?

The investigation is limited to pre-medical sciences students at the University of South Florida, and no attempt is made to generalize beyond that population. A limitation with regard to the variables is that many items reflect uncomfirmed statements made by the applicants. The sample for the study was delimited to applicants to dental schools and to allopathic medical schools during the academic year 1976-77. The sample for the dental applicants was smaller than desired; in fact, the number of applicants neccessitated using the entire population in the study.

Another delimitation of the survey is the independent variables are

those found in the evaluator's report and certain qualitative variables are the perceptions of one individual.

The following terms are used in the study.

Applicant

A student who formally is seeking admission to a professional school in medicine or dentistry.

Allopathy

A medical system which makes use of all measures proved to be of value in treatment of disease.

Osteopathy

A medical system based on a theory that diseases are chiefly due to the loss of structural integrity which can be restored by manipulation of parts supplemented by theraputic measures.

Using the frequencies on data run, a profile of the successful pre-medical and pre-dental applicants was constructed using the following categories: Personal Characteristics, Family Background, Academic Qualities, and Evaluations. Next, sucessful and unsuccessful applicants were compared using modal values for qualitative variables and mean values for quantitative variables. Successful and unsuccessful applicants were then compared further by showing the range of values for selected variables.

The multiple linear regression was programmed to display the variables in a standard stepwise regression form. In this method, each vari able is treated as if it had been added to the regression equation in a separate step after all other variables had been included. Initially, the program was set to show the top ten variables, but an analysis of

the results necessitated a second run of the pre-medical applicants for the top fifteen variables.

Finally, data from both groups were examined to test the null hypothesis that the multiple correlation is zero in the population from which the sample was drawn. Because the number of missing values in variable 38 for both groups reduced the degrees of freedom, a second run was made deleting this variable. This increased the degrees of freedom from 18 to 30 for the pre-medical group, and from 10 to 16 for the pre-dental group.

Results

The characteristics of the successful applicants can be summarized in the following profile of selected variables using modal values for qualitative variable and mean values for quantitative variables.

Table 1

Profile of a Successful Applicant to a School of Medicine or Dentistry

	Medical	Dental
Personal Characteristics	Male, age 22.4 better than average appearance, grooming, and personality.	Male, age 20.8 better than average appearance, grooming, and personality.
Family Background	Father is professional military man; both parents are living and together; at most one brother or sister; no relative in profession.	Father is blue collar worker in wholesale trade, construction, or manufacturing; both parents are living and together; at most one brother or sister; no relative in profession.
Academic Qualities	Chemistry major earning all credits at U.S.F; GPA of 3.76; science GPA of 3.68; average load per term of 15 MCAT subscores 571,590, 532, 628; FTG total 441; average drops of 1.3	Chemistry major earning all credits at U.S.F.; GPA of 3.51; science GPA of 3.36; average load per term of 14.6 DAT average 5.1; PMAT average 5.2; FTG total 438; average drops .5
Extra Curricular	May have had: part time job in high school and college; volunteer experience in health related area; membership in honor societies but not in social clubs.	Had part time job in high school and college; may have had volunteer experience in health related area; no membership in honor societies or social clubs.
Evaluations	Superior ratings by instructors; advisor rating of highest or next to highest.	Superior ratings by instructors; advisor rating of highest or next to highest.

Tables 2 and 3 compare characteristics of the successful and unsuccessful applicant for all independent variables. Unless otherwise indicated, modal values and percents are used for all characteristics.

Table 2

Characteristics of Applicants to Medical Schools

Variable	Successful	%	Unsuccessful	%
Age	22.4		23.2	67
Sex	Male	67	Male	67
Appearance	Better than ave	67	Better than ave	43
Personality	Better than ave	60	Better than ave	50
Parent's Status	Liv & together	60	Liv & together	47
No. Bros & Sisters	0 or 1	80	1	27
Brdwnr Occ Status	Professional	33	Professional	37
Brdwnr Occ Area	Military	27	Physician	20
Relative in Prof	No	80	No	63
Total Transfer Hrs	0	40	0	37
Transfer GPA (mean)	2.53 (trans only)		2.89 (trans only)	
Total USF Hrs (mean)	94.3		114.4	
USF GPA (mean)	3.76		3.37	
USF Sci GPA (mean)	3.68		3.28	
Scholarships	0	93	0	80
No. CLEP Hrs	0	53	0	70
Grad w/Honors	Not yet	67	Not yet	37
No. Crs Drpd (mean)	1.3		2.1	
Ave Load/Term (mean)	15		12.7	
Major	Chemistry	33	Zoology	27
Part Time Job H.S.	Yes	67	Yes	30
Part Time Job Coll	Inconclusive		Yes	57
Full Time Job Coll	Inconclusive		Yes	57
Vol Work Health Area	Inconclusive		No	53
No. Instr Ratings	4 or 5	80	4	27
No. Sup Ratings(mean)	63.4		50.4	
No. Good Rat (mean)	31.2		34.9	
No. Ave Rat (mean)	2.1		2.7	
No. H. Des (mean)	3		2.8	
No. Des (mean)	1		1.1	
No. Less Des (mean)	.1		.33	
MCAT (Verbal)(mean)	571		544	
MCAT (Quant)(mean)	590		563	
MCAT (GenInf)(mean)	532		518	
MCAT (Science)(mean)	628		566	
FTG Total (mean)	441		408	
Coll Honor Soc	Inconclusive		No	53
Coll Soc Clubs	No		No	73
Eval. Rating	Inconclusive		Next Highest	53

Table 3

Characteristics of Applicants to Dental Schools

Variable	Successful	%	Unsuccessful	%
Age	20.8		21.9	
Sex	Male	80	Male	94
Appearance	Better than ave	50	Better than ave	56
Personality	Better than ave	60	Inconclusive	
Parent's Status	Liv & together	90	Liv & together	67
No. Bros & Sisters	0 or 1	80	1 or 2	56
Brdwnr Occ Status	Blue collar	60	Blue collar	33
Brdwnr Occ Area	W.Trd,Man, Const	20	Engineering	17
Relative in Prof	No	90	No	78
Total Transfer Hrs	0	60	0	39
Transfer GPA	3.26 (trans only)		3.01 (trans only)	
Total USF Hrs (mean)	109		125	
USF GPA (mean)	3.51		3.15	
USF Sci GPA (mean)	3.36		2.94	
Scholarships	0	70	0	94
No. CLEP Hrs	0		0	72
Grad w/Honors	No	60	No	83
No. Crs Drpd (mean)	.5		2.17	
Ave Load/Term (mean)	14.6		13.1	
Major	Chemistry	30	Biology	22
Part Time Job H.S.	Yes	50	Yes	39
Part Time Job Coll	Yes	70	Yes	89
Full Time Job Coll	No	70	Yes	56
Vol Work Health Area	Inconclusive		No	67
No. Instr Ratings	5	50	2 or 3	56
No. Sup Ratings(mean)	70.5		45	
No. Good Rat (mean)	33.5		64	
No. Ave Rat (mean)	2.4		0	
No. H. Des (mean)	2.4		1.9	
No. Des (mean)	1.7		1.1	
No. Less Des (mean)	.1		.3	
DAT Average (mean)	5.1		3.9	
PMAT Average (mean)	5.2		4.2	
FTG Total (mean)	438		396	
Coll Honor Soc	Yes	80	No	72
Coll Soc Clubs	No	70	No	77
Eval. Rating	Highest	50	Next Highest	67

The results for some of the independent variables warranted additional comments. In particular, Table 4 shows the range of values for successful and unsuccessful candidates.

Table 4

Range of Values for Successful and Unsuccessful Applicants to Medical and Dental Schools

Variable		Medical	Dental
Age	Successful	19 - 29	19 - 22
	Unsuccessful	19 - 31	20 - 27
Transfer Hours	Successful	9 - 192	90 - 108
	Unsuccessful	21 - 215	36 - 120
Transfer GPA	Successful	2.15-4.00	3.05-4.00
	Unsuccessful	1.82-3.95	2.16-3.93
U.S.F. GPA	Successful	3.42-4.00	3.04-3.97
	Unsuccessful	2.43-4.00	2.80-3.45
U.S.F. Science GPA	Successful	3.30-4.00	2.67-3.95
	Unsuccessful	2.17-4.00	2.41-3.41
MCAT Subscores	Successful	385 - 715	
		455 - 695	
		455 - 595	
		495 - 725	
	Unsuccessful	355 - 695	
		435 - 665	
		365 - 725	
		435 - 725	
DAT Average	Successful		3 - 9
	Unsuccessful		0 - 6
PMAT Average	Successful		3 - 8
	Unsuccessful		0 - 7
No. Courses Dropped	Successful	0 - 9	0 - 2
	Unsuccessful	0 - 9	0 - 9

Equality of opportunity for females was examined by inspection of the sex variable. Although males continue to dominate in both applications and acceptances for both groups, the success rate for females was effectively the same as that of males. In the successful group, males outnumbered females 11 to 4 for the pre-medical applicants and 8 to 2 for the pre-dental applicants. For the unsuccessful group, the figures were 20 to 10 and 17 to 1, respectively. Thus, the success rate of males was 34%, compared to 35% for females.

Another frequently asked question is the probability of success for the post-baccalaureate applicant. Of the pre-medical group, 3 successful and 5 unsuccessful applicants had post-baccalaureate status. Thus, 18% of the pre-medical applicants had post-baccalaureate status, and of that subclass 38% were successful and 62% were unsuccessful. None of the pre-dental applicants had post-baccalaureate status.

The standard regression format of the SPSS indicated the variable with the greatest prediction value with success in admission to a school of medicine was V14, Overall Grade Point Ratio. Important statistics for this variable (to four decimal places) were as follows:

Multiple R = 0.5352

R Square = 0.2865

Std Error = 0.4096

where Multiple R = the correlation coefficient

R Square = the coefficient of determination

Std Error = the standard error of estimate

The prediction equation for this variable was

$$V1 = 4.2558 - .7390(V14)$$

where V1 = Dependent variable, Admission

V14 = Independent variable, Overall GPA

The value of F for the prediction equation was 11.6444, which was significant at the .01 level with 30 degrees of freedom.

The two variables with the greatest predictive value with success in admission to a medical school were Overall GPA (V14) in combination with the MCAT (Science) subscore (V37). Important statistics for these variables were:

Multiple R = 0.6184

R Square = 0.3825

Std Error = 0.3878

The prediction equation for this pair of variables was

$$V1 = 5.1866 - .6536(V14) - .0021(V37)$$

For multiple independent variables, the null hypothesis to be tested was that the multiple correlation is zero in the population from which the sample was drawn, or equivalently, that all regression coefficients were equal to zero in the population. The value of F for the combination of variables was 8.6706, which was significant at the .01 level, thus the null hypothesis was rejected.

The individual F's were 9.770 for V14, and 4.352 for V37. At 27 degrees of freedom, only V14 was significant at the .01 level; V37 was significant at the .05 level.

The three variables with the greatest prediction value for success in admission to medical school were the combination of Overall GPA (V14), MCAT Science (V37), and Average Load per Term(V20). Important

statistics for these variables were:

Multiple R = 0.6491

R Square = 0.4213

Std Error = 0.3823

The prediction equation for this combination of variables was:

V1 = 5.6639 - .7315(V14) - .0016(V37) - .0373(V20)

The overall value of F was 6.5525, which was not significant at the .01 level, but was significant at the .05 level. Of the individual variables, only V14 was significant at either the .01 or .05 level.

The multiple regression was programmed to display the top ten independent varibles which in combination had the greatest predictive value for success in admission to a medical school. The list of these variables in order is:

V14 Overall GPA

V37 MCAT Science Subscore

V20 Average Load per Term

V18 Graduated with Honors

V33 Evaluator's Rating

V29 Number of Average Ratings by Instructors

V4 Appearance

V26 Number of Instructor Ratings

V27 Number of Superior Ratings by Instructors

V28 Number of Good Ratings by Instructors

For these variables in combination, the important statistics were:

Multiple R = 0.9207

R Square = 0.8594

Std Error = 0.2190

The overall F for the ten variables was 12.2219, which was significant at the .01 level.

An examination of the change in R Square for the ten variables generally indicated a decreasing contribution to the amount of variance as each variable was added. However, the ninth and tenth variables showed an unusual increase in the change in R Square. For this reason, the investigator chose to program the regression package to display the top fifteen variables in combination. With this change, the following five additional variables were generated:

V25 Volunteer Work in Health Area

V36 MCAT General Information Subscore

V11 Total Transfer Hours

V15 U.S.F. Science GPA

V19 Number of courses Dropped

The addition of these variables resulted in an overall F of 4206.1924, obviously significant. In addition, all individual variables were significant at the .01 level. The unexpected increase in the change in R Square continued only to the eleventh variable V25; the change in the remaining variables decreased dramatically. Other important statistics for the model containing 15 variables were:

Multiple R = 0.9998

R Square = 0.9998

Std Error = 0.0104

The standard regression format of the SPSS was also utilized for the pre-dental applicants. For this group, the independent variable with the greatest predictive value with success in admission to a dental school was V33, Overall Rating of the Evaluator. Important statistics for this variable were:

Multiple R = 0.6216

R Square = 0.3864

Std Error = 0.3984

The prediction equation for this variable was

V1 = .7810 + .4155(V33)

The value of F was 9.444, which was significant at the .01 level with 16 degrees of freedom.

The two variables with the greatest prediction value with success in admission to a dental school were the Evaluator's Rating (V33) in combination with Number of Superior Ratings by Instructors (V27). Important statistics for these variables were:

Multiple R = 0.7442

R Square = 0.5538

Std Error = 0.3484

The prediction equation for this pair of variables was:

V1 = 1.3125 + .3174(V33) - .0075(V27)

Testing for the null hypothesis that the multiple correlation is zero, the overall value of F was 8.6895, which is significant at the .01 level. Individual F's were 6.269 for V33 and 5.255 for V27. At 16 degrees of freedom, both were significant at the .01 level.

The three variables with the greatest predictive value for success in admission to dental school were the Evaluator's Rating (V33), Number

of Superior Ratings by Instructors (V27), and College Honor Society (V41). Important statistics for these variables were:

Multiple R = 0.8078

R Square = 0.6526

Std Error = 0.3191

The prediction equation for this combination of variables was

V1 = .9473 + .2541(V33) - .0073(V27) + .3168(V41)

The overall value of F was 8.14, which was significant at the .01 level. Individual F's were 4.435, 5.884, and 3.695 for variables 33,27, and 41 respectively. Only the second F was significant at the .01 level; the others were significant at the .05 level.

Similar to the pre-medical group, the regression was programmed to display the top ten variables which in combination had the greatest predictive value for success in admission to a dental school. For the dental group, the maximum value was reached with eight variables. These were as follows:

V33 Evaluator's Rating

V27 Number of Superior Ratings by Instructors

V41 College Honor Society Membership

V30 Number of Highly Desireable Overall Ratings by Instructors

V22 Job in High School

V10 Relative in Profession

V6 Parent's Status

V18 Graduated with Honors

Important statistics for these variables were:

Multiple R = 0.9998

R Square = 0.9996

Std Error = 0.0136

The overall value of F for these variables was 2584.6749, clearly significant at the .01 level. Individual F's were all significant at the .01 level.

Discussion, Implications, and Recommendations

The results of the survey indicate that admission to a professional school in medicine or dentistry remains a highly subjective process. The descriptive statistics of Tables 1 to 4 confirm this.

Table 2 indicates that academic performance continues to be an important selection criterion. In both the pre-medical and pre-dental groups the mean overall GPA for the successful applicants was nearly 4/10 of a point higher than that of the unsuccessful group. The overall GPA was also the number one predictor variable for the pre-medical group. Science GPA's were also higher for the successful applicants, particularly for the pre-medical group. On the other hand, Table 4 demonstrates that high averages were not a guarantee of successful admission and that other variables are considered. There was a considerable overlap of the scores, and the upper range of GPA's for the unsuccessful group was the same for the pre-medical group, although lower for the pre-dental group.

MCAT scores continue to be an important selection criterion according to Table 2, supporting the claim of Haley (1971). Mean scores for the successful applicants were substantially higher than those of the unsuccessful applicants, particularly the Science subscore. This latter variable was also a significant predictor variable in the regression analysis. But Table 4 again shows considerable overlap in the scores of the successful and unsuccessful applicant.

The successful and unsuccessful applicants in Tables 2 and 3 were

remarkably similar. In the addition to the quantitative variables dicussed above, only one other variable was significantly higher for the successful applicants, the Number of Superior Ratings by Instructors. Mean values were 13 points higher for the pre-medical group, and nearly 25 points for the dental group. The ratings of instructors also appeared in the regression analysis, for both groups. The rating of the evaluators did not show discrimination in the descriptive statistics, but was an important predictor variable in the regression analysis. In the pre-dental group, it was the most important predictor variable.

While the ratings of the instructor and the evaluator are partially based on objective evidence, they are heavily weighted towards measures of subjective attributes such as character, personality, etc. Since most accepted applicants are also personally interviewed by selection committees of the professional school, one must conclude that these qualities are subjectively recognizeable and play an important role in the selection process. The identification of these traits remains elusive and were not identified clearly by this survey.

The regression analysis confirmed the interplay of numerous variables which contribute to the selection process. The pre-medical analysis was heavily weighted towards the combination of grades, test scores, and ratings of the faculty. The pre-dental analysis placed less emphasis on grades; however, the combination of variables which did have the greatest predictive value was difficult to categorize.

It is recommended that the results of the survey be used in two ways. A summary of the results should be made public information for all pre-medical and pre-dental students in the College. In particular, the profiles of the successful applicants should provide these students

with a good competition yardstick. Secondly, the results of the survey should be provided to the pre-medical sciences advisors. It is anticipated that these results will serve to simplify and to better standardize their evaluation procedures.

It is also recommended that a similar survey be conducted on subsequent classes. The present survey included scores on an MCAT examination which had been superceded by a new examination with different emphases and different scoring (Angel, 1977). Analyses similar to the present survey but with more recent and more standardized data should provide a useful means for quality control of the pre-medical advising services of the College.

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